UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL SERVICES DIVISION
REGION 7
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KANSAS CITY, KANSAS 66115

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MEMORANDUM

SUBJECT: Summary of the Multimedia Inspection - The Doe Run Company - Herculaneum Smelter, Herculaneum, MO

FROM: Kris Goschen
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THRU: Leo J. Alderman
Director, Environmental Services Division

TO: Martha R. Steincamp
Regional Counsel

This memorandum transmits the summary of significant findings and observations made during the coordinated level D multimedia inspection at The Doe Run Company's Herculaneum Smelter, Herculaneum, Missouri. The inspection was performed between January 31, and February 7, 1995. It consisted of comprehensive regulatory evaluations to determine Doe Run's compliance with the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA/NPDES), the Clean Air Act (CAA), the Safe Drinking Water Act - Underground Injection Control (SDWA/UIC), and the Emergency Planning and Community Right-To-Know Act (EPCRA). The SDWA/UIC inspection was conducted jointly by the EPA and the Missouri Department of Natural Resources' (MDNR) Division of Geological and Land Survey (DGLS). MDNR also assisted in the RCRA and CAA inspections. Individual media inspection reports may be obtained by contacting the appropriate program representative.

Participants

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Background

The Doe Run Company owns and operates an integrated lead mining, milling, smelting, and refining company in eastern Missouri. Company operations include six lead mines (in the Viburnum Trend), four mills, and two smelters. Lead ore, known as galena, is processed in the mills to form lead concentrate. The lead concentrate consists of approximately 80% lead sulfide. The concentrate is shipped from the mills to the Herculaneum smelter, located in Herculaneum, Missouri. The Herculaneum facility operates 24-hours per day, 350 days per year. The smelting operations occupy approximately 28 acres of a 620 acre site which is bordered on the east by the Mississippi river and on the west by residential areas. Currently the facility employs approximately 325 people and produced approximately 194,000 tons of lead in 1994.

Sintering, refining, and sulfuric acid production are the major process operations that occur at the Herculaneum facility. These processes begin upon receipt of seven to eight rail cars of lead ore concentrate per day by the facility. The concentrate is mixed with materials from 23 different bins. The mixing reduces the lead sulfide concentration in the concentrate and forms the proper sinter feed mix. Sintering occurs in a large furnace-like device where the sinter mix is ignited and burns via exothermic reaction, driving off excess sulfur and forming lead oxide clinker. The clinker is fed into one of three blast furnaces where it is reduced to metallic lead bullion. The bullion drains out of the blast furnace and is transferred to the dross furnace. The dross furnace is the start of the refining operation. Bullion from the dross furnace is poured into 1 or more of 13 large kettles. Various metallurgical processes are used to remove zinc, copper, arsenides, and silver. Dross, skimmings of lighter metals and impurities, are removed and recycled through the sinter machine. Specialized vacuum condensation processes are used on some of the kettles to condense out the remaining small quantities of zinc and providing a high purity lead product. Alloying of bullion is also done as part of the refining process. The product bullion is pumped through heated casting lines and cast into pigs and ingots, or processed into sheet lead. Waste sulfur containing gases produced by the sintering operation are routed to a MONSANTO acid plant. This 1970-era plant produces approximately 50-60,000 tons of sulfuric acid per year. The acid is stored in on-site tanks until it can

be loaded onto trucks, rail cars, or barges for off-site transport.

Inspection Findings and Observations

CWA/NPDES

The purpose of the NPDES inspection was to determine compliance with the parameters identified in Doe Run's NPDES permit. Doe Run uses as much as 140 gallons per minute of process water in it smelting operations. This water is drawn from three ranney wells located near the Mississippi river. City water is used for sanitary purposes and a few specialized process applications. Sanitary wastewater is discharged to the city POTW. Process wastewaters are largely recycled after varying degrees of treatment. Doe Run has three permited outfalls, #001, #002, and #003. Wastewater treatment sludges are returned to the sinter plant and filtrate from the filter press is returned to an equalization tank. Grab samples were taken from outfall #001 and analyzed for metals content and pH. At the time of the inspection there were no discharges from outfalls #002 and #003.

The following regulatory violations or concerns were noted during the inspection:

- Analysis of the grab sample for metals showed no exceedences. However, an exceedence of the discharge limit for pH was identified. The permit specified range is between 7.5 and 10 standard units. The pH was measured at 10.33 standard units. Additionally, the pH meters used by Herculaneum are not calibrated using the two-point standard method.

- A review of the 1994 self-monitoring records revealed exceedences of the permit limits for lead, zinc, and total suspended solids (TSS) occurred at outfalls #001 and #002. In addition, the values for TSS and arsenic were not reported for some months.

- Records were not maintained which identified the analytical procedures used during monitoring of discharge parameters.

- During the 1994 DMR QA performance audit of Doe Run's Viburnum laboratory, e.g., the laboratory used by Herculaneum, unacceptable values for BOD, copper and TSS were identified. Herculaneum's self-monitoring data may need to be reevaluated.

- Herculaneum does composite sampling for TSS but only does grab sampling for metals analysis. Composite sampling should be evaluated for use during all sampling as it

generally provides more representative results.

- The cyclone system in the clarifier was not working during the inspection. Repair of this system is needed to assure maximum efficiency during wastewater treatment.

RCRA

The Herculaneum facility had notified EPA that they were operating as a small quantity generator of hazardous waste (100-1000 kg/mo). However, upon review of their waste generation and management practices, the Herculaneum facility was found to be operating as a large quantity generator of hazardous waste (>1000 kg/mo). The major waste streams generated by the facility include spent parts washer solvents, spent grease, spent refractory brick, used oils, primary smelter slag, nickel speiss, and baghouse dust. Herculaneum also processes secondary smelter slag from Doe Run's Boss, Missouri, smelting facility. This slag is managed under a MDNR Resource Recovery Permit. It is used as a raw material feedstock substitute during the preparation of the sinter mix.

The following apparent regulatory violations of RCRA were noted during the inspection:

- Failure to up-date generator notification
- Failure to maintain LDR notifications
- Failure to maintain manifest records
- Failure to use consecutive manifest document numbers
- Failure to keep containers closed
- Failure to have a personnel training program that met the RCRA requirements
- Failure to mark the date of accumulation on containers
- Failure to properly label containers with the words "Hazardous Waste"
- Failure to have a contingency plan designed to meet the RCRA requirements
- Failure to comply with the waste pile requirement
- Failure to make adequate waste determinations

CAA

Herculaneum, Missouri, is located within a non-attainment area for lead, per the National Ambient Air Quality Standards. In order to bring Doe run into compliance with these standards, two State Implementation Plans (SIPs) have been developed, e.g., 1990 and 1993. At the time of the inspection, only the 1990 SIP was Federally enforceable. The Herculaneum facility is also subject to the Missouri air pollution control rules, including those governing lead smelting, and has one emission point subject to the Federal New Source Performance Standards for Primary Lead Smelters.

At the time of the inspection, no apparent regulatory violations were noted. However, on May 5, 1995, the 1993 SIP received final approval. Additional emission control measures will need to be implemented in order to achieve compliance with the 1993 SIP.

EPCRA

During the inspection, a data quality assessment was completed and compliance under Section 312 and 313 of EPCRA, and Section 103 of CERCLA was evaluated. The following apparent regulatory violations were identified:

- Failure to submit Form R reports for 1989, 1990, and 1991. These reports were required due to the high levels of chromium contained in the refractory brick.

- Failure to make an immediate notification under CERCLA 103 for daily releases of lead sulfide emissions for 1993.

SDWA/UIC

The purpose of the UIC inspection was to identify if any waste management activities caused the facility to be subject to the UIC regulations. The SDWA/UIC inspection was conducted jointly by the EPA and the MDNR DGLS.

No UIC regulated units were identified during the inspection

Potential Cross-Media Implications

During the review of the individual inspection reports, the following areas were identified as having potential cross-media implications. It is recommended that they be further evaluated.

- EPCRA/RCRA

Waste analysis and determination for the used refractory brick.

Pollution Prevention

The facility was provided general pollution prevention guidance and source material during the inspection.

Program Representatives

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